REMARKS

Claims 17, 19, 20 and 22-33 currently appear in this application. The Office Action of October 10, 2007, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Election/Restriction

Applicants hereby confirm the election of claims 17-20 and 22-24.

Rejections under 35 U.S.C. 112

Claims 17-20 and 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 17 is said to lack antecedent basis for "the area of joining" and "the welding are". Claim 22 is said to be indefinite because the term "led ahead" is said to render the claim indefinite.

This rejection is respectfully traversed. Claims 17 and 22 have been amended to correct the indefiniteness.

Claim Objections

Claims 17-20 and 22-24 are objected to because of informalities.

The informalities in claim 17 have been corrected.

Art Rejections

Claims 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Holmes et al., U.S. 6,451,152.

This rejection is respectfully traversed. Claim 17 has been amended to recite so-called transmissive welding of thermoplastic molded articles. This transmissive welding is explained in the specification: a laser transmissive join partner is superimposed onto a laser absorptive join partner. The laser transmissive join partner is not heated by the laser welding beam, while the laser absorptive join partner absorbs energy from the laser, melts, and by means of heat transport to the laser transmissive join partner forms a weld seam along the travel path of the laser welding beam.

Because the laser transmissive join partner on top of the assembly does not absorb energy from the laser, the melting step is somewhat critical, as the temperature field in the welding area exhibits a strong gradient from the laser absorptive join partner to the laser transmissive join partner. This inhomogeneity leads to problems in heat transfer form the laser absorptive join partner to the laser

transmissive join partner. Therefore, the weld quality is susceptible to any gaps or inadequate clamping conditions between the join partners.

In order to render conditions less critical in the welding, the herein claimed invention provides an electromagnetic secondary radiation which, contrary to the laser welding beam passing the transmissive join partner with no substantial energy transfer, heats the laser transmissive join partner to generate therein a temperature increase. This means that the temperature gradient between the laser melted absorptive join partner and the laser transmissive join partner is decreased. This is recited in claim 17 as, "the temperature field in the welding area is homogenized," such that the welding process is substantially less critical with respect to the heat transfer and melt joining of both join partners.

The core of this process as outlined above is made clear by the article attached hereto from *Joining Plastics 2/07*, in both German and English. This article makes the properties and advantages of the herein claimed process very clear.

It is respectfully submitted that Holmes does not anticipate claims 17-20 or 22-24. First of all, Holmes does not refer to welding thermoplastic molded articles, but merely

to heating and controlling the temperature of composite materials comprising a substrate and layers made of tapes on thee substrate. In this connection, laser radiation is used for heating the substrate and the tapes to "soften the resin and promote adhesion of the tape to the substrate." (column 1, lines 33-35) Accordingly, Holmes does not mention any welding in which at least one join partner is melted, *i.e.*, liquefied along a defined welding seam.

The plurality of laser beams generated by a laser diode array as proposed in Holmes makes it possible to tailor the distribution of the light energy to the particular configuration of the composite article being produced, thereby optimizing the temperature profile on the article (column 1, lines 59-63) However, "optimizing the temperature profile" in Holmes means that the profile of the laser intensity across the width of the tape is, for example, varied as a function of the path along which the tape is steered during placement on the substrate (column 2, lines 32-35), or a light field is produces whose width generally matches the bandwidth of the tape. In particular, attention is directed to figures 9 through 13 of Holmes as well as the accompanying description, which clearly discloses that the laser illumination is controlled based upon the geometric conditions of eth placement region.

All of the different laser beams of the Holmes laser diode are controllable laser beams of one single specific wavelength, and thus form one primary radiation that heats both the substrate and the tapes for softening them and to promote adhesion of the composite layers. However, Holmes is silent about any secondary radiation which, contrary to the primary laser beam, heats up the join partner whose temperature is not increased by the laser beam. It is respectfully submitted that a part of the laser diode 40 is not a secondary radiation, as it is the same type of radiation as the laser beams from the remaining laser diodes.

If one skilled in the art were to transfer the teaching of Holes to the transmission welding of claim 17, this would mean that a part of the laser beams generated by the laser diode array would be focused on the laser absorptive join partner lying underneath the laser transmissive join partner. In this case, the laser transmissive join partner of course must be transmissive for this laser wavelength. This is the reason that Holmes does not work in the same manner as the presently claimed method. In fact, when directing the laser beams of the laser diode array that are not focused to the laser absorptive join partner to the laser transmissive join partner, there would be no effect, as this join partner is transmissive to the laser wavelength and thus does not

absorb any energy therefrom. It is clear from this explanation that the Holmes laser diode array cannot be divided into a primary welding radiation and a secondary heating radiation.

Holmes clearly fails to disclose important features of the herein claimed invention, which are the use of a primary laser welding radiation on the one hand and a secondary radiation on the other hand for selectively heating one of the join partners, which secondary radiation must be different form the laser radiation. The use of two different kinds of radiation is tellingly reflected by the title of the enclosed article, "**Hybrid** welding of plastics… the **combined utilization of laser radiation and heating radiation** during the welding process…" [emphasis added]

Claim 24 is rejected under 35 U.S.C. 103(a
0 as being unpatentable over Holmes and further in view of Chen et al., EP1405713.

This rejection is respectfully traversed. As noted above, Holmes has nothing to do with the hybrid welding of plastics using both laser radiation and secondary radiation. Chen does not add anything to Holmes, as Chen merely discloses that laser radiation can be focused through a swiveling ball that applies pressure to the welding are to adjust the laser

beam to provide precise welding and pressing using the same working head.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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